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SLIDER: Satellite Loop Interactive Data Explorer in Real-time

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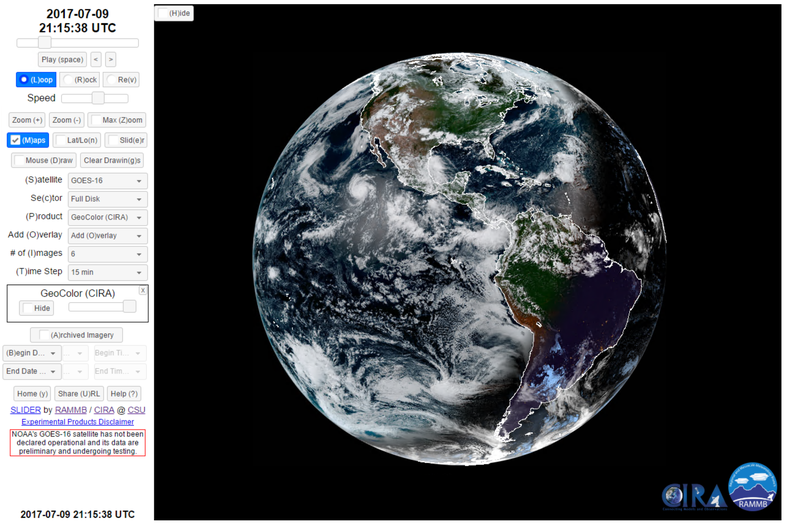

Figure 1: SLIDER displaying GOES-16* full disk imagery of CIRA's GeoColor product, zoomed out to view the entire image.

Introduction

New visualization tools are needed to facilitate the exploration of the immense data sets of satellite imagery from GOES-16 and other new satellites. The Satellite Loop Interactive Data Explorer in Real-time (SLIDER) web application, recently developed for RAMMB at CIRA, provides every pixel of GOES-16 and Himawari-8 imagery to both the scientific community and the general public on a user-friendly website. A PCT patent application has been filed for SLIDER, due in part to its use of "image tiling" without the need for geolocation data, which helps it to display satellite imagery loops over the web more effectively than other geospatial data frameworks.

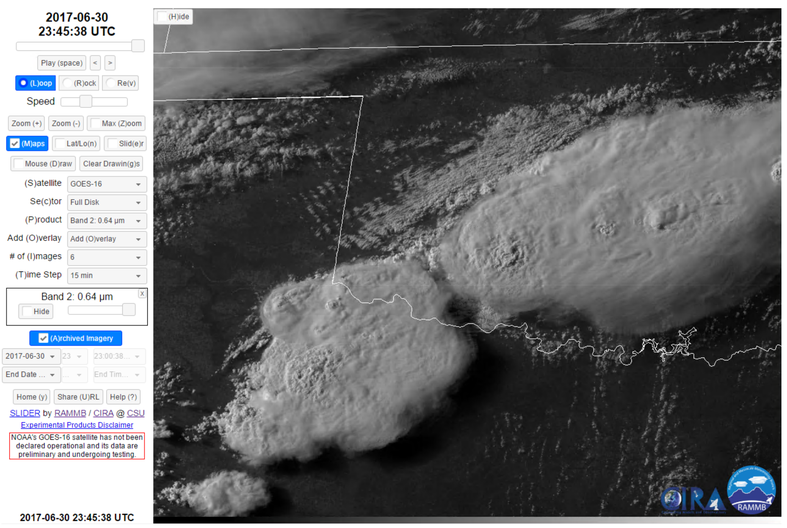

Figure 2: SLIDER displaying GOES-16 full disk band 2 imagery zoomed in to full resolution over convection near the Texas/Oklahoma border.

**NOAA's GOES-16 satellite has not been declared operational and its data are preliminary and undergoing testing.*

Core Features

- Includes all available GOES-16 sectors including Full Disk, CONUS, and both Mesoscale sectors (similar for Himawari)
- Provides access to all 16 bands for each sector at full resolution
- Includes some of CIRA's derived products, with more on the way
- Offers enhanced user capabilities:
  - Zoom in on interesting features in the imagery
  - Drag imagery around to view different parts of it
  - Toggle on/off a map and lat/lon lines
  - Choose the time step and the number of images in the loop

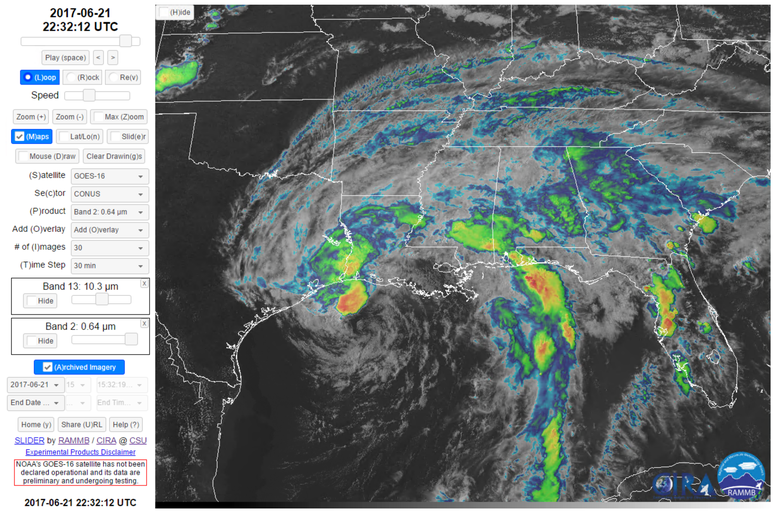

Figure 3: SLIDER displaying GOES-16 CONUS band 2 imagery, with band 13 imagery overlaid on top at 50% opacity, showing tropical storm Cindy as it made landfall on 21 June 2017.

Advanced Features

- Provides an archive of ~10 TB of imagery (currently over two months)
- Includes keyboard shortcuts for almost everything
- Saves all user's changes immediately in URL
  - Share exact loops through email and social media
- Works in the browsers on many smartphones
- Offers advanced user capabilities:
  - Hide/show loops
  - Overlay multiple loops and vary their transparencies
  - Compare multiple loops side-by-side using the "slider" feature
  - Draw on imagery (useful for presentations and training activities)

Find SLIDER on the Web

URL: http://rammb-slider.cira.colostate.edu/
TinyURL: http://col.st/MjXeN
Scan this QR code with your phone:

Contact: Kevin Micke, RAMMB/CIRA/CSU, 1375 Campus Delivery, Fort Collins, CO, 80523 kevin.micke@colostate.edu

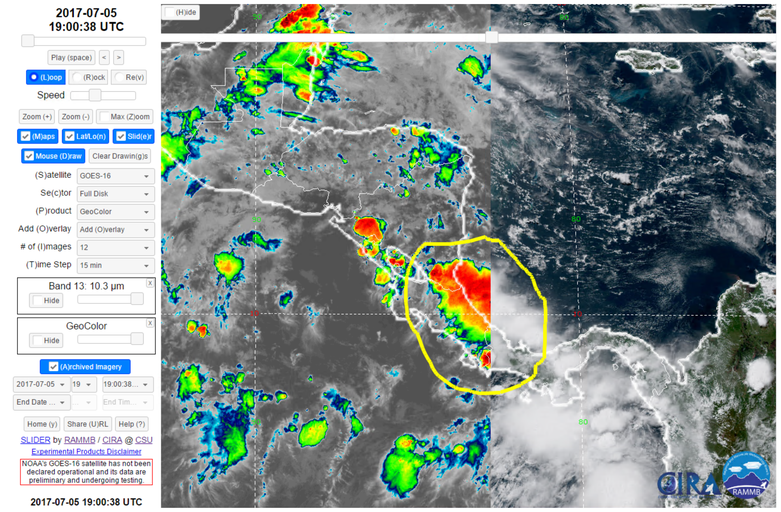

Figure 4: SLIDER demonstrating the "slider" feature that allows users to compare imagery loops side-by-side. On the left is GOES-16 full disk band 13 imagery, and on the right is CIRA's GeoColor product. Moving the slider bar at the top of the screen allows the user to change where the two loops meet while the loop runs. Also shown is the mouse-drawing feature that allows users to draw on the imagery, which is useful for presentations and training activities.

Future Development Plans

- Flow-following loops that allow users to keep moving features in the imagery (such as tropical storms) centered in the screen as the imagery loops
- Model data that can be overlaid in addition to imagery overlays
- GOES-16 GLM (Geostationary Lightning Mapper) data overlays
- Imagery from additional satellites, such as JPSS and MSG
- Auto-refresh for real-time data
- Additional maps, including roads and major cities
- Download of displayed loops as animated GIFs, if possible

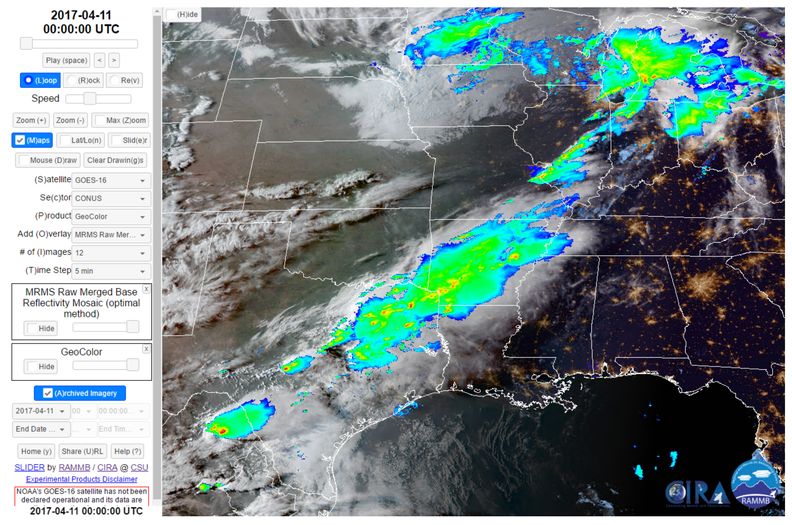

Figure 5: SLIDER displaying a case study with CIRA's GeoColor product overlaid with radar data from NSSL's MRMS (Multi-Radar/Multi-Sensor) Raw Merged Base Reflectivity Mosaic. Future plans include making select MRMS data available in SLIDER in real-time.